

FUJITSU Software BS2000 SHC-OSD

Version 13.0C
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Release Notice

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1 General

This Release Notice is a summary of the major extensions, dependencies and operating information with respect to SHC-OSD V13.0 under the BS2000 operating system.

- *2 The release level is that of SHC-OSD V13.0C: January 2019
- *2 Changes to release level SHC-OSD V13.0B, April 2018 are marked with *2.
- *1 Changes to release level SHC-OSD V13.0A, December 2017 are marked with *1.

The SHC-OSD (STORAGE-HOST-COMPONENT) software product is the BS2000 host component for storage systems. SHC-OSD makes storage management functions available to the BS2000 operating system for the storage systems ETERNUS DX and ETERNUS AF of FUJITSU resp. Symmetrix^{®1}, VMAX[®] and VMAX3[®]/VMAX All Flash[™] of EMC Corporation.

SHC-OSD implements information services and control commands for local and remote replication functions of the storage systems. Support is offered for following replication functions of the storage systems:

- Equivalent Copy (EC), QuickOPC, SnapOPC+, Remote Equivalent Copy (REC) and Storage Cluster Option (SCO) for ETERNUS DX / AF.
- TimeFinder/Clone, TimeFinder/Snap resp. TimeFinder SnapVX and Symmetrix-Remote-Data-Facility (SRDF[™]) for EMC storage systems.

SHC-OSD supports the functions Thin Provisioning and Advanced Storage Tiering on ETERNUS DX / AF and offers support of Virtual Provisioning on EMC storage systems.

This and other current Release Notices are shipped on the SoftBooks DVD and are available online at <http://manuals.ts.fujitsu.com>.

If one or more previous versions are skipped when this product version is used, the information from the Release Notices (and README files) of the previous versions must also be noted.

1.1 Ordering

SHC-OSD V13.0 can be ordered from your local distributors.

This software product is supplied subject to a single payment or payment by instalments.

1.2 Delivery

The SHC-OSD V13.0 files are supplied via SOLIS.

The StorMan V8.0 files are supplied on CD-ROM/DVD with installation instructions.

The following delivery groups are part of the SHC-OSD V13.0 delivery scope:

SHC-OSD	V13.0
STORMAN-CD	V8.0

¹ Symmetrix[®], VMAX[®], VMAX3[®], VMAX AFA[™], SRDF[™], TimeFinder[™] and Engenuity[™] are trademarks or registered trademarks of EMC Corporation, Hopkinton/MA (USA).

Release Unit SHC-OSD V13.0:

The following delivery components are required regardless of the HSI:

SINLIB.SHC-OSD.130	Library for POSIX functions
SIPLIB.SHC-OSD.130	Library with privileged macros
SYSDMP.SHC-OSD.130	Procedure file for DAMP
SYSDOC.SHC-OSD.130.OSS	License file for SHC-OSD
SYSENT.SHC-OSD.130	Enter file for SHC-OSD user task
SYSEFGM.SHC-OSD.130.D	Release Notice (German)
SYSEFGM.SHC-OSD.130.E	Release Notice (English)
SYSMES.SHC-OSD.130	Message file
SYSPAR.SHC-OSD.130	Parameter file for SHC-OSD
SYSPAR.SHC-OSD.130.PTH	Parameter file for PTHREAD options
SYSPRG.SHC-OSD.130	Program file SHC-OSD
SYSREP.SHC-OSD.130	REP file for SHC-OSD
SYSRME.SHC-OSD.130.D	Readme file (German), optional
SYSRME.SHC-OSD.130.D	Readme file (English), optional
SYSRMS.SHC-OSD.130	REP depot
SYSSDF.SHC-OSD.130	SDF syntax file
SYSSII.SHC-OSD.130	IMON installation information
SYSSMB.SHC-OSD.130	Symbol file for DAMP
SYSSPR.SHC-OSD.130	Start procedure for SHC-OSD user task
SYSSSC.SHC-OSD.130	Subsystem declarations

The following delivery components are only required on servers with /390-architecture:

SYSLNK.SHC-OSD.130	Load module library
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The following delivery components are only required on servers with x86-architecture:

SKMLNK.SHC-OSD.130	Load module library
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Release Unit STORMAN-CD V8.0:

*2 StorMan V8.0.2-0 for Windows, Linux and M2000, as of Release 01.2019

Information about installation is available on CD in file readme_en.html.

1.3 Documentation

The BS2000 documentation is available in German and English on DVD with the title BS2000 SoftBooks.

The documentation is also available on the internet at <http://manuals.ts.fujitsu.com>.

The manuals may be supplemented with README files. These contain changes and extensions to the manual of the product concerned. The README files are available on the SoftBooks-DVD or online under <http://manuals.ts.fujitsu.com>

2 Software extensions

The following section describes the extensions and improvements over the previous version SHC-OSD V12.0.

2.1 Extensions for ETERNUS DX / AF

*1 **Support of the storage systems ETERNUS DX S4**

*1

*1 SHC-OSD V13.0 supports the storage systems ETERNUS DX500 S4 and
 *1 ETERNUS DX600 S4 on S-Server as of OSD/BC V10.0 and on SE Server (as of
 *1 SE-SW V6.2) as of OSD/XC V10.0

*1 **Support of the storage system ETERNUS AF650 S2**

*1 SHC-OSD V13.0 supports the storage system ETERNUS AF650 S2 in OSD/XC as
 *1 of V10.0 on SE Server (SE-SW as of V6.2).

Support of QuickOPC

SHC-OSD V13.0 supports Clone based on QuickOPC. Unlike EC Clones, local copies of a unit created by QuickOPC are available immediately after start.

QuickOPC is not available for ETERNUS DX S2.

Improved local replication with SnapOPC+

Local replication using SnapOPC + allows snaps without specially configured Snap Data Volumes (SDVs). With SHC-OSD V13.0, Thin Devices (TDEV) or Flex Volumes (FDEV) can now also be used as Snap volumes.

This feature is not available for ETERNUS DX S2.

Support of Storage Cluster Option (SCO)

The "Storage Cluster Option (SCO)" function links two ETERNUS DX / AF storage systems to form a fail-safe "storage cluster".

Features offered:

- Output of configuration and status information about the storage cluster
- Monitoring functions
- Manual failover und failback for storage cluster

Failover/failback of a storage cluster has an impact on parallel replication actions (Clone, Snap, Remote Copy) for volumes of this cluster.

Please refer to corresponding notes in the user manual of SHC-OSD.

*1 Using the Storage Cluster Option under BS2000 can also require optional corrections
 *1 in BS2000-GA, depending on the operating system version and server type. Please
 *1 refer to the release notes of OSD/BC or OSD/XC.

SCO is not available for ETERNUS DX S2.

2.2 Changed commands

ACTIVATE-CLONE

- deleted operand COPY-COMPLETE-DATA
- new command return codes (NDE1057, NDE1548) in case of rejection

FAILBACK-STORAGE-CLUSTER

- manual start of storage cluster failback
- *2 the operand value for CLUSTER-NAME may be abbreviated to a minimum of 3
- *2 characters
- new command return codes (NDE1600, NDE1601, NDE1602, NDE1603, NDE1607, NDE1608) in case of rejection
- *2 - console messages (NDE0080, NDE0081) report the current state of the storage cluster

FAILOVER-STORAGE-CLUSTER

- manual start of storage cluster failover
- *2 - the operand value for CLUSTER-NAME may be abbreviated to a minimum of 3
- *2 characters
- new command return codes (NDE1600, NDE1601, NDE1602, NDE1603, NDE1607, NDE1609) in case of rejection
- *2 - console messages (NDE0080, NDE0081) report the current state of the storage cluster

MODIFY-SHC-ENVIRONMENT

- deleted parameter CIMOM-SERVER

RESTART-CLONE-SESSION

- deleted operand START-COPY
- new operand CLONE-TYPE = *UNIQUE/*MIRROR/*COPY
- new operands in structure UNIT = *BY-PUBSET() for clone type *COPY
NEW-PUBSET=*SAME/catid1..4/*SPECIAL-VSN
HOLD-IO=*NO/UNITIL-ACTIVATED
- new command return codes (NDE1548, NDE1530, NDE1057) in case of rejection

RESTORE FROM-CLONE

- new operand CLONE-TYPE = *UNIQUE/*MIRROR/*COPY
- new command return codes (NDE1548, NDE1530, NDE1178) in case of rejection

*2 RESTORE FROM-SNAP

- *2 - new operand RENAME-PUBSET = *NO/ *SAME/cat-id_1..4
- *2 in structure UNIT=*BY-PUBSET()

START-CLONE-SESSION

- deleted operands DIFFERENTIAL and COPY-COMPLETE-DATA
- new operand CLONE-TYPE = *UNIQUE/*MIRROR/*COPY
- new operands in structure UNIT = *BY-PUBSET() for clone type *COPY
NEW-PUBSET=*SAME/catid1..4/*SPECIAL-VSN
HOLD-IO=*NO/UNITIL-ACTIVATED
- new command return code (NDE1057) in case of rejection

-CLONE-SESSION-STATUS

- new operand CLONE-TYPE = *ANY/*MIRROR/*COPY
- new operand value *ALL in UNIT=*BY-STORAGE(SERIAL-NUMBER=?)
- *2 - new operand INFORMATION = *STD/*CONTINUOUS-COPY

SHOW-SNAP-SESSION-STATUS

- new operand value *ALL in UNIT=*BY-STORAGE(SERIAL-NUMBER=?)

- SHOW-STORAGE-CLUSTER-CONFIG
- *2 - the operand value for CLUSTER-NAME may be abbreviated to a minimum of 3
- *2 characters
- new information about configuration and state of the storage cluster and information about SCO volumes

SHOW-STORAGE-CONFIGURATION

- new operand values INFORMATION=*STORAGE-CLUSTER/*PORT for additional information about the storage cluster

SHOW-STORAGE-DEVICE-CONFIG

- additional volume information for QuickOPC and SCO
- *2 - extended output „SED“ (Self Encrypted Disk) with
- *2 INFORMATION=*ALL/PHYSICAL
- *2 - new operand value *SCO-PAIRS in structure
- *2 SELECT=*BY-ATTRIBUTES(CONFIGURATION=?)

START-CLONE-SESSION

- deleted operands DIFFERENTIAL und COPY-COMPLETE-DATA
- new operand CLONE-TYPE = *UNIQUE/*MIRROR/*COPY

STOP-CLONE-SESSION-STATUS

- new operand CLONE-TYPE = *UNIQUE/*MIRROR/*COPY
- new command return codes (NDE1548, NDE1530, NDE1178) in case of rejection

SWAP-CLONE

- new command return codes (NDE1057, NDE1549) in case of rejection

SYSPAR.SHC-OSD.130

- deleted parameter STORMAN-PORT
- new parameter CLONE-TYPE = MIRROR/COPY
- new parameters to control SYSTEM-ADMIN-SCOPE
- DETACHED-DEVICES = REJECT/ACCEPT
- NOT-DEFINED-DEVICES = REJECT/ACCEPT
- *2 - new parameter STORAGE-CLUSTER-MONITORING =
- *2 ON/OFF/BS2-VOLUMES

3 Technical information

3.1 Resource requirements

The address space in the user catalogue must be set for the user TSOS and SYSROOT at least to 512 MB.
Approx. 200 MB must be provided for SHC-OSD in the POSIX /var file system.
The paging area should be extended at least by 512 MB.

These values only meet minimum requirements.

3.2 Software configuration

SHC-OSD V13.0 requires OSD/BC as of V10.0 on S server, resp. OSD/XC as of V10.0 on SE server.

The respective current correction level of BS2000 must be used. At least required is:

- *2 - OSD/BC V10.0 resp. OSD/XC V10.0
as of correction package 2018, release date June 2018
- *2 - OSD/BC V11.0 resp. OSD/XC V11.0
as of correction package 2018, release date June 2018

Using ETERNUS DX / AF requires:

- *2 - StorMan V8.0,
as of correction level 8.0.2-0, release date January 2019

Using ETERNUS DX / AF replication functions with SHC-OSD requires acquisition and installation of additional products in BS2000:

- SHC-CM-LR V13.0 for local replication (EC, QuickOPC, SnapOPC+)
- SHC-CM-RR V13.0 for remote replication (REC)

Using EMC storage systems with SHC-OSD requires an external management server with „Solutions Enabler“ resp. „Unisphere for VMAX“.

3.3 Product installation

Installation of the product SHC-OSD V13.0 with the IMON installation monitor is mandatory. You must follow the information concerning installation in the delivery cover letter and in the product documentation as well as the information in this Release Notice.

Install and configure StorMan (ETERNUS DX / AF) on the external StorMan server resp. SYMAPI (EMC storage systems) on the external SYMAPI server, before installation of SHC-OSD in BS2000.

In case of migration to SHC-OSD V13.0 and ETERNUS DX / AF usage, an upgrade to the current release of StorMan V8.0 is required in advance.

3.3.1 Installation/Configuration of external components

3.3.1.1 StorMan (ETERNUS DX / AF)

The installation of the StorMan delivery components takes place on one or more external servers (Management Unit (MU), Linux or Microsoft Windows). LAN (TCP/IP) is used for communication between SHC-OSD and StorMan. StorMan needs a LAN connection to the managed storage systems. CIMOM server settings (IP address and access data of the SMI-S provider) must be configured in StorMan. Details see manual StorMan V8.0.

3.3.1.2 SYMAPI (EMC storage systems)

EMC demands a management server with „Solutions Enabler“ resp. „Unisphere for VMAX“. This server needs FC connections to the Symmetrix systems and the gatekeeper devices.

LAN (TCP/IP) is used for communication between SHC-OSD (SYMAPI client) and the SYMAPI server. Only the IPv4 protocol is approved by EMC for BS2000 usage.

The SYMAPI server has to accept unencrypted connections from the SYMAPI client:

```
SYMAPI_SECURITY_LEVEL= ANY
in file .../EMC/SYMAPI/config/options.
```

To allow the modification of diagnostic settings by SHC-OSD:

```
Set storsrvd:permit_symapi_debug = CLIENT
in file .../EMC/SYMAPI/config/daemon_options.
```

More details see manual SHC-OSD V13.0.

3.3.2 Installation/Configuration of the BS2000 components

In case of product upgrade stop the subsystem SHC-OSD before calling IMON.

1) Installation with IMON.

Install SHC-OSD V13.0 on BS2000 and POSIX.

ETERNUS DX / AF:

Install software licences CM-LR V13.0 and/or CM-RR V13.0 on BS2000 and POSIX.

2) Customize SYSPAR.SHC-OSD.130.

ETERNUS DX / AF:

Parameters STORMAN-HOST, STORMAN-PORT, ...

Remove, if applicable, the parameter SYMAPI-HOST=127.0.0.1 of a previous installation.

EMC storage systems:

Parameters SYMAPI-HOST, SYMAPI-PORT, ...

3) Activation of the release unit SHC-OSD:

a) by means of IMON (POSIX must be started, no BS2000 shutdown required)

```
//ACTIVATE-UNITS UNIT-NAME=*SUPPLY-UNIT(UNIT-NAME=SHC-OSD)
```

b) alternatively /SHUTDOWN and restart of BS2000 and POSIX

3.4 Product use

There are HW-dependent differences between EMC storage systems and ETERNUS DX / AF at the replication functions. Please observe the manual SHC-OSD V13.0 when changing the hardware platform of the disk storage system.

During a BS2000-VM migration no SHC-OSD actions should be performed in the guest system.

Replication actions (Clone, Snap, Remote Copy) during cluster failover/failback should be avoided for volumes of this cluster.

3.5 Discontinued functions (and those to be discontinued)

The following functions are no longer supported as of this version:

- Operation on SQ-Server
- Symmetrix DMX-4 EMC storage systems
- TimeFinder/Mirror (BCV)
- BS2000 Snapsets at the SRDF target of EMC storage systems
- ENABLE-REMOTE-LINK-DIRECTOR / DISABLE-REMOTE-LINK-DIRECTOR

3.6 Incompatibilities

If BS2000 volumes on TDEV/FDEV of ETERNUS DX / AF or BS2000 volumes on VMAX3 / VMAX All Flash are to be used for automatic assignment as snap units, especially in Snapset scenarios, they must be initialized in advance with the VOLIN utility and attached to the specific system. The special notation S#<mn> must be used as VSN for these volumes, e.g. S#5234, where <mn> is the device mnemonic.

No EMC storage data from SM2 with following settings of statement

//SET-STORAGE-SYSTEM-PARAMETERS:

- ADDITIONAL-DATA= *ALL
- ADDITIONAL-DATA= *SYMMETRIX(TYPE=*ALL)
- ADDITIONAL-DATA= *SYMMETRIX(TYPE=*DIRECTOR)

TimeFinder SnapVX doesn't support mixed operation of the native SnapVX function and TimeFinder/Clone (emulated by TimeFinder SnapVX) on the same logical volume of VMAX3 / VMAX All Flash.

The functions eManagement (usage of the embedded „Solutions Enabler“) and SRDF-Metro are not supported by SHC-OSD.

3.7 Restrictions

None

3.8 Procedure in the event of errors

If an error occurs, the necessary error documents for diagnose are described in manual SHC-OSD V13.0.

4 Hardware requirements

SHC-OSD V13.0 runs on S-Server as of OSD/BC V10.0 and on SE Server as of OSD/XC V10.0.

4.1 Requirements for X2000

SHC-OSD V13.0 can be used with all current versions as of SE-SW V6.1.

4.2 Disk storage systems

SHC-OSD V13.0 supports the following ETERNUS DX / AF models:

	Model	Remarks
	DX410 S2	
	DX440 S2	
	DX8700 S2	
	DX500 S3	
	DX600 S3	
	DX8700 S3	
*1	DX500 S4	S-Server, SE Server as of SE-SW V6.2
*1	DX600 S4	S-Server, SE Server as of SE-SW V6.2
*1	AF650 S2	SE Server only; as of SE-SW V6.2

Appropriate hardware licenses are required in the ETERNUS storage system for the use of "Thin Provisioning", "Automated Storage Tiering" and "Storage Cluster Option". In order to use replication functions, all the ETERNUS storage systems require the "Hardware Advanced Copy" license.

SHC-OSD V13.0 supports the following EMC storage models:

Model	Remarks
VMAX	
VMAX 20K	
VMAX 40K	
VMAX3	
VMAX All Flash	

In order to use TimeFinder and SRDF functions, you must have the respective licenses for all storage systems which use them. A license is required to use SHC-OSD with SYMAPI. It is installed directly in the storage system by EMC Support. In order to use virtual provisioning, no separate license is required.

5 Firmware levels

5.1 ETERNUS DX / AF

With ETERNUS DX / AF following FW levels are required at least:

ETERNUS DX S2 storage systems

Model	FW level as of
DX410 S2	V10L64
DX440 S2	V10L64
DX8700 S2	V10L64

ETERNUS DX S3 storage systems

	Model	FW level as of
*2	DX500 S3	V10L82 SAN
*2	DX600 S3	V10L82 SAN
*2	DX500 S3	V10L83 Unified
*2	DX600 S3	V10L83Unified
*2	DX8700 S3	V10L82 SAN

ETERNUS DX S4 and ETERNUS AF S2 storage systems

	Model	FW level as of
*1		
*1		
*2	DX500 S4	V10L82 SAN
*2	DX600 S4	V10L82 SAN
*2	AF650 S2	V10L82 SAN

5.2 EMC storage systems

The following Engenuity resp. HYPERMAX OS and SYMAPI versions will be supported:

VMAX storage systems

	Model	Engenuity	SYMAPI as of
*2	VMAX	e5876 ^{*1}	V9.0
*2	VMAX 20K	e5876 ^{*1}	V9.0
*2	VMAX 40K	e5876 ^{*1}	V9.0

*1 For SRDF connections to VMAX3 or VMAX All Flash a suitable correction level should be coordinated with EMC support.

VMAX3, VMAX All Flash

	Modell	HYPERMAX OS as of	SYMAPI as of
*2	VMAX3	5977	V9.0
*2	VMAX All Flash	5977	V9.0